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# **Older people as users and non-users of video conferencing service for promoting social connectedness and well-being – A case study from Finnish Lapland**

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# Older people as users and non-users of a video conferencing service for promoting social connectedness and well-being – A case study from Finnish Lapland

**Objectives:** There is a need to better understand older people's use, non-use, and learning of eHealth services in their everyday lives. This paper reports a case study of a phone and video conferencing service aimed at promoting the social connectedness and well-being of older people in the sparsely populated area of Finnish Lapland. **Method:** The data were derived from qualitative semi-structured interviews of a service coordinator (n = 1), volunteers (n = 2), and service users (n = 2). The volunteers were 69 and 71 years old, and the service users were 88 and 89 years old. **Findings:** Service coordinator and volunteers described the service as a new and needed service for sparsely populated areas. It supports social interaction and well-being of older people. However, some users experienced inconvenience of the service and concern, such as negative feelings due to technical problems. Reported barriers relating to the learning and use of the service included negative perception of oneself as a technology user and cognitive and physical difficulties. Reported enablers included technical support and older people's willingness and ability to practice and learn. **Conclusion:** eHealth services can be experienced as useful, especially by older people living in sparsely populated areas. However, inconvenience, concerns, and barriers were recognized as influencing older people's willingness to use the service. Older people's digital competence and distributed digital competencies within their network play important roles in learning to use and using an eHealth service. Digital competence also influences domestication of the technology.

Keywords: older people, digital competence, eHealth service, well-being, sparsely populated area

## Introduction

Social isolation and loneliness pose a growing threat to the physical and mental health of older people (Alpert, 2017; Chen & Schulz, 2016; Hagan, Manktelow, Taylor, & Mallett, 2014). According to the World Health Organization ([WHO], 2019), mental health is a state of well-being where every individual can be an important part of a community and feel that their everyday life has meaning. Moreover, health entails ‘complete physical, mental and social well-being and not merely the absence of disease or infirmity’ (WHO, 2019). Social isolation and loneliness also increase the risk of all-cause mortality; conversely, social networks and support are protective against mortality (Alpert, 2017; Holt-Lunstad, Smith, & Layton, 2010). Aging is often related to the narrowing of social networks, and social isolation and physical decline may compound the problem of loneliness (Alpert, 2017; de Guzman et al., 2012). Alpert (2017) defined social isolation as ‘an objective state of having minimal social contact with others as opposed to loneliness which is viewed as a subjective state of distress due to self-perceptions of being lonely and not belonging’ (p. 250).

The term assistive technology (AT) is used to refer to technology applications aimed at supporting social contact among elderly people (Zwijssen, Niemeijer, & Hertogh, 2011). As physical and cognitive decline or long distances in remote areas may prevent older people from going out to participate in activities, information and communication technology (ICT) provides an alternative way for elderly people to connect with others (Hasan & Linger, 2016; Kilpeläinen & Seppänen, 2014; Tsai, Shillair, Cotten, Winstead, & Yost, 2015).

This paper presents a case study involving a phone and video conferencing (VC) service for older people living in sparsely populated areas of Finnish Lapland. The service is aimed at promoting users’ social connectedness and well-being. The municipality providing the service purchases it from a non-governmental organization (NGO). NGO volunteers call the service users at a scheduled time once a week. Prior to this study, the service users participated in a

pilot project in which they could choose either a regular call or VC call. For the VC call, service users had a touch screen at home, and volunteers used devices at the voluntary service center. Presently, only regular calls are possible, for example, because of unsolved technical problems and because, now that the pilot project is over, there is a charge to use VC devices, which service users do not wish to pay. The following central question guided the case study research: What factors contributed to the learning, use and non-use of phone and videoconferencing service among a select group of older people in Finnish Lapland?

This study had a culturally oriented approach (Rasi, 2018; Slack & Wise, 2009), which acknowledges that different cultural and social structures, practices, and discourses guide people to use technologies (Gilleard & Higgs, 2015; Talsi, 2014). The concept of *domestication of technology* describes adopting technology in everyday life (Lie & Sørensen, 1996; Silverstone & Haddon, 1996; Talsi, 2014). Domestication of technology focuses on the users themselves and how they socially and culturally shape technologies in their everyday lives (Bakardjieva, 2010; Olsson & Viscovi, 2018). The use and non-use of technology are seen as part of the wider picture of a user's everyday life; however, for older people the home usually always has a special part in it (Bakardjieva, 2010) because the home is the primary place for growing old, and older people spend the majority of their time at home (Gitlin, 2003). When focusing on everyday life, meaning is also important to the use and non-use of technology (Hakkarainen, 2012), which is why in the current study we also look at meanings select group of older people, volunteers and a service user assign to the phone and VC service. Meaning is a silent part of culture and individuals' thoughts, feelings, and ways of seeing the world (Gubrium & Holstein, 2000; Talsi, 2014).

We explored older people's use of the VC service through the concept of *digital competence*. The European Commission's 'DigComp – Digital Competence Framework for Citizens 2.0' defines digital competence as the confident and critical use of ICT tools in work,

employability, education, leisure, inclusion, and participation in society (Vuorikari, Punie, Carretero, & Van den Brande, 2016). The framework includes five competencies: (1) information and data literacy, (2) communication and collaboration, (3) digital content creation, (4) safety, and (5) problem solving. ‘Safety’ includes the competency ‘protecting health and well-being’, which means, for example, being aware of digital technologies for social well-being and social inclusion (Vuorikari et al., 2016, pp. 8–9).

However, the DigComp framework can be criticized for being individual-centric and decontextualized. Therefore, we followed a socially and culturally oriented approach and understood digital competencies as the distributed and situated competencies of couples living together, families, and informal and formal networks of older people in their everyday lives (Lipponen, 2010; Olsson & Viscovi, 2018; Rasi & Kilpeläinen, 2015). To understand the digital competencies of older people living in sparsely populated areas, we followed the New Literacy Studies’ conceptualization of literacy as culturally situated social practices rather than as decontextualized skills located in the individual (see Ivanic, 2004; Lipponen, 2010). As competencies cannot be understood out of context, the emphasis in this study was on the social aspects that frame older people’s digital competencies and willingness to use a VC service.

## **Previous research**

Previous systematic reviews indicated the effectiveness of ICT interventions in preventing and reducing social isolation among the elderly (Antunes et al., 2019; Chen & Schulz, 2016). However, researchers have also voiced concerns that digital healthcare might reduce human contact with care professionals and, thus, exacerbate such social isolation (Kim, Gollamudi, & Steinhubl, 2017; Zwijsen et al., 2011). Researchers in this field, therefore, have called for more studies exploring the effectiveness of ICT interventions (Alpert, 2017; Hagan et al., 2014; Hasan & Linger, 2016). As not all older people use ICT, it is important to consider the reasons

for their non-use (see Rasi, 2018). In the context of health care–related ICT, the accessibility of support, lack of interest in ICT use, and health status have been named as *barriers* to the adoption of health care–related ICT (Heart & Kalderon, 2013).

Researchers have concluded that older adults are not yet ready to adopt health-related ICT and, therefore, ICT should be kept simple and adequate support and training, which is mindful of older people’s personal and cultural traits, should be provided (Antunes et al., 2018; Peek et al., 2014; Heart & Kalderon, 2013). For example, data gathered from the present research site, Finnish Lapland, indicate that older adults consider the cell phone to be the most important device for social connections (Kilpeläinen & Seppänen, 2014; see also Yuan, Hussain, Hales, & Cotten, 2016). Thus, Kilpeläinen and Seppänen (2014) argued that ‘while IT-based social relationships are still in their infancy, cell phones have already had a strong impact on social contacts and reduce loneliness, especially among the elderly’ (p. 7).

Researchers have identified the following disadvantages to older people’s use of new technologies: technical problems, time and effort needed to learn to use the technology, and difficulties in learning to use the technology (Savolainen et al., 2008). Conversely, they have identified the following key *enablers*: self-efficacy (skills and confidence in using new media technologies), social support networks, and family composition—especially having children in the household (see Livingstone, Van Couvering, & Thumim, 2005). Regarding older people’s adoption of mobile health (mHealth) technologies, perception of usefulness, self-efficacy, and cost of the device and service have been found to directly influence the usage or intention to use mHealth (Spann & Stewart, 2018).

## **Methods**

The present study was a case study of older people’s use of a phone and VC service in Finnish Lapland. The Ethical Review Committee of the Lapland University Consortium evaluated and

approved the research plan. The case study method was chosen because there was a need to explain the present circumstances of a specific service and explore its relation to a contemporary phenomenon in Lapland—that is, social connectedness and loneliness (Swanborn, 2010).

The data were obtained from qualitative semi-structured interviews (Gillham, 2005) conducted with a VC service coordinator (n = 1), volunteers (n = 2), and service users (n = 2). The sample size was small, but was sufficient for being a representative case (Swanborn, 2010). The interviews with service users were conducted in a previous pilot project titled ‘A Well-Functioning Home Care to Lapland – Diverse Forms of Support to Living at Home’ (funded by Ministry of Social Affairs and Health, 2016–2018), and the transcribed audio-recordings were reanalyzed according to the aforementioned central and sub questions of our study. The interviewees gave informed consent to participate in the study. The volunteers were 69 and 71 years old. The service users were 88 and 89 years old, and lived in a sparsely populated area about 50 km from the nearest municipality center. The service users in the pilot project were interviewed two or three times via a phone call and a VC call. The service coordinator and volunteers were interviewed face-to-face once in February–March 2019. The interviews lasted from 24 to 70 minutes. The interview topics and questions were specified in advance and they are presented in table 1.

[Place Table 1 here]

The interviews were audio-recorded with the interviewee’s informed consent and transcribed verbatim by a transcription service for subsequent analysis. In total, 44,200 words were transcribed. The data were analyzed using a qualitative thematic approach (Bazeley, 2013) including both deductive and inductive analyses. The deductive analysis utilized barriers and enablers of technology use reported in previous research and the aforementioned culturally oriented approach.



NVivo 12 data analysis software was used for coding the service coordinator's and volunteers' interviews. The first author analyzed the service coordinator's and volunteers' interviews and then collaboratively checked and completed the analysis with the second author to enhance the trustworthiness of our study (Bazeley, 2013). Next, the third author analyzed the service users' interviews. The first round of thematic analysis of the interviews produced 70 subcategories (see Tables 2–4). In the second round of analysis, the categories were clustered into upper-level categories ( $n = 5$ ) to produce a more nuanced understanding. In the following sections, we present the findings according to the central question and sub question of our study which are: *What factors contributed to the learning, use and non-use of phone and videoconferencing service among a select group of older people in Finnish Lapland?* and *What kinds of meanings select group of older people, volunteers and a service user assigned to the phone and video conferencing service?* Also citations from the interviews have been used to increase credibility and openness of the study (Bazeley, 2013).

### **(Non)Using and learning to use the service**

Concerning how participants were using or not using and learning to use the phone and VC service, the data analysis produced 49 subcategories of barriers and enablers of use (Table 2 & 3).

#### ***Barriers to learning and using the service***

[Place Table 2 here]

In the volunteer and service coordinator interviews, *technical problems*, *lack of experience*, *lack of telephone speaking skills*, and *lack of a technical device* were reported as barriers to learning to use and using the VC service. Furthermore, all interviewees experienced technical problems, such as bad connection and bad audibility.

At our end, I mean, technical ones, at times, the audio went out and, at times, the visual, and at times, we couldn't get a connection when we placed a call. Sure, it could, I mean, it could've been that the elderly person did not have the dongle on, or something, and they didn't know how to turn it on if it had been switched off for some reason. The technology should be so simple that everything is turned on by pressing a button there. (Service coordinator)

*Privacy* issues have been taken into account in the service, yet it can still be a barrier for some users. According to the service coordinator, the VC devices provided in the pilot project were secured. However, volunteers reported that some service users were not used to the VC devices and were concerned about safeguarding their privacy. Furthermore, they were not comfortable with their home being displayed on the screen.

The interviews also revealed that using the service to alleviate loneliness could be *stigmatizing* for service users. Fear of being stigmatized as 'lonely' might also explain *the difficulties in marketing the service* that one volunteer discussed:

It's been challenging for us to find people who we could sort of enroll in this phone group because we have kind of thought that it may be a bit difficult for elderly people to admit or to say out loud that they are lonely. A lot easier to ask for a person to talk or walk with, even if one never had the strength to leave the house. It also often happens that when they have asked for a person to go outside with, they just end up talking anyway. So, it's kinda like... Who would be willing to admit they are lonely? (Service coordinator)

The volunteer-user relationship can be a barrier to using the service if *participants do not 'click'* or users start to develop *inappropriate romantic feelings* or exhibit *inappropriate*

*behavior* toward volunteers. For example, one service user was drunk more than once during a call and sexually harassed the volunteer. According to the service coordinator, some older people refuse the phone or VC service because they *need face-to-face contact*—that is, someone visiting them and accompanying them when they leave their home.

Other barriers to VC service use that the volunteers and service coordinator reported were negative *attitude, lack of courage* and *cognitive and physical difficulties*. Negative attitude and lack of courage were related to the technology and uncertainty about the new service. Memory disorder was mentioned as the main cognitive difficulty and, therefore, as a barrier to service use. With the exception of not being able to hold the phone for the duration of the call, physical difficulties were not mentioned as barriers to using the VC service. In addition to technical problems, the most important reason that service users gave for non-use was their poor health ('so ill', 'in such a bad condition') and tiredness ('too tired'). Non-use was also associated with insufficient support. Despite receiving help and being quite happy with the support they received from their sons, technology advisor, and the company providing the service, the service users had unmet needs:

And then my son... sometimes, when he was here, well, he had it all worked out and, and gave me advice, but after he left, well there I was without help... But I don't lose my temper, so I didn't start out by getting all nervous about it [comparing oneself to another user who had barely started using the device]. And last fall, they brought it to me, and that was, what, six months, so there were a few things I didn't quite get, and I got exhausted and couldn't cope with it, so I didn't even touch it, and they took it away (Service user)

Personal characteristics or circumstances related to not using or learning to use the service were illness, tiredness, shyness, not being able to learn at all, slowness in learning or not being able

to learn at once, not being interested or inspired, not knowing how to use the device, and lack of practice. The reasoning for non-use was associated with technical problems and difficulties with use.

Currently, service users are charged for using VC devices, and they are not ready to pay for them. Interestingly, one volunteer said that some service users misunderstand that the VC service increases their phone bill; therefore, they want to keep VC calls short:

One factor is that we're not used to long telephone conversations, so people like me have always thought that the phone bills will be enormous, and that you just say what's necessary and then hang up. So, you don't start reminiscing about all kinds of things there. In other words, it has been like, that you must gradually get them acquainted with it. (Volunteer)

### ***Enablers to learning and using the service***

[Place Table 3 here]

According to the volunteers, users' *previous experience* and a well-functioning, reliable *technical device* can support their use and learning of the VC service. Without technical problems, the use of, and learning to use, VC devices would have been easier and the positive effects of seeing each other and not needing to hold the phone would have been realized:

Yes, and since we now have the devices and the service available, it would be super cool to make it work. (Coordinator)

Service users expressed some uncertainty about the use of VC service—about the whole idea and the ability to learn to use the device. Both service users evaluated themselves as learners and VC service users. The characteristics that they associated with successful usage

were *good memory, courage, ability to take care of oneself and one's business, enthusiasm, calmness or patience, and interest.*

*Support for volunteers* (professional guidance and possibility to talk to the service coordinator) and *technical support* for all users were seen as very important things, especially regarding technical problems with the VC service. Volunteers and service users saw older people's family members as playing an important role, especially when initially using the technology. For service users, using and learning to use the VC service were embedded in relationships and social interaction with the technology advisor, home care personnel, and their children. When service users were asked about concrete things that helped them learn, they identified their own activities (e.g., repetition) and other people's help as key factors:

Well there is no... can there even be any other [way to learn] than, than, that someone, someone is here teaching and I would watch and say that, but, you don't learn at one go even then. No. ...There's got to be repetition. (Service user)

...and, well, I've been practicing now, and it was this [name of technology advisor omitted] who, who brought the device here and gave initial instructions, but now it's not... it's impossible to learn in one go. (Service user)

The volunteers and service coordinator pointed out that *positive volunteer-service user relationships* are key to the service's effectiveness. Furthermore, the service coordinator brought up the fact that the *service is free* for service users, and that service users are often amazed about this and are even willing to pay something.

*Attitude, cognitive and physical abilities, and good cognitive and physical health* were mentioned in the volunteer and service coordinator interviews as things that support the use and learning of the VC service. The positive and open-minded attitude that some older people

have toward new things keep the service running. It was observed that the right attitude can compensate for service users' lack of experience:

And that's why it was so wonderful that they took it on without prejudice, that they didn't, and hadn't, used a computer, nothing, not even a smartphone. Still, they went along with it, so that's why it really was a shame that the technology didn't work, 'cause they actually had high hopes for it. (Volunteer)

### **Meanings assigned to the service**

The data analysis produced 21 subcategories of meanings, clustered into three upper-level categories: support for social interaction and well-being, new and needed service for a sparsely populated area, and source of inconvenience and concern (Table 4).

[Place Table 4 here]

#### ***Support for social interaction and well-being***

A key meaning of the service was that it helped to *establish networks* and *reduce loneliness*. The service coordinator explained that users (mostly widows) needed friends and someone to talk to:

A lot of old people are living out there far away, maybe the spouse has died, and you live alone in a house, and you probably can't even see the neighbor's lights there in the middle of nowhere. That's why they've sought some kind of security and company and whatever it might bring along—a little bit of excitement.

(Service coordinator)

Other meanings identified in the analysis include *provider of joy* and provider of meaningful *activities and structure* in the everyday lives of service users and volunteers. The service

activities were described as *rewarding* because they provided joy and energy to volunteers.

Both service users stressed the importance of company:

The kind of good folks who I can understand and who understand me. So that the interaction, it's mighty important. (Service user)

One volunteer explained that the service is meaningful in *maintaining the cognitive functions* of older people, in particular, through *reminiscing* together. The service evokes many different feelings among those involved. The *positive feelings* mostly included the joy of talking to someone and making the service user happy. The volunteers reported that the service worked well via a regular phone, but they spoke enthusiastically about the possibilities of VC. Compared to the phone service, one meaning of the VC service that the volunteers and service coordinator described was supporting *social presence*, as the volunteers and service users could see each other and, for example, sing, have coffee together, reminisce, and have *deep conversations*.

[Through a VC device] it was possible to get closer to the daily life of the supported person, so, it was a very cozy situation when the other one is sitting in a rocking chair somewhere far away in [name of place omitted] sipping coffee and I'm having a cup here, and then we take out the song books and sing away, and we even hugged virtually, so that they were, it was very close and warm.  
(Volunteer)

### ***New and needed service for rural areas***

Providing *needed services* for older people living alone in *sparsely populated areas* was described as an important meaning of the service. The service coordinator also mentioned the organization's plans to recruit new volunteers to accommodate all older people who are willing

to use the service. *Staying abreast of technological developments* was mentioned as a driving force behind use of VC. The service coordinator underlined that the phone or VC service allows volunteers to meet more service users than home visits permit. In this way, the service *promotes efficiency*:

Or when we're in a situation where, on the support person side, we have way more requests than volunteers, I mean there's always maybe twenty or thirty people in line waiting for their own support person. (Service coordinator)

### ***Source of inconvenience and concern***

For the users, the VC service was clearly a source of inconvenience and concern. According to the volunteers and service users, the main *negative feeling* that the service evoked was frustration due to *technical problems*:

At first, I used [VC device] and I liked it. But... these devices didn't work with this person. The service user didn't want it because I was breaking up all the time. We tried to fix it and all, so this person blew a fuse and said that we should use an ordinary, I mean, a cell phone. So, we continued with cell phones. And it worked just as well. (Volunteer)

Furthermore, the service coordinator and volunteers said that for some service users, the service is *secondary* in meaning to their other activities. For example, service users could have guests visiting or would be about to eat lunch, which kept the call shorter or even ended the call:

They're 30-minute phone calls, on average, but of course, it happens that a person may have guests and it only lasts five minutes, but then some may last more than an hour. (Service coordinator)



## Discussion

The findings of this case study on a phone and VC service for older people living in sparsely populated areas of Finnish Lapland are in line with previous research showing that ICT interventions can reduce social isolation and foster new social relationships for older people (e.g., Antunes et al., 2019; Chen & Schulz, 2016), and can be especially useful for older people living in rural areas (Kilpeläinen & Seppänen, 2014; Pols, 2012). The analysis indicated that using the VC service supported the users' well-being by generating new social relationships and meaningful activities, all of which are key factors for older people's well-being (e.g., Nyqvist, Forsman, Giuntoli, & Cattani, 2013).

However, the participants' perspectives differed slightly. Whereas the service coordinator and volunteers discussed users' positive emotions and the service as a new and needed service for sparsely populated areas, the users emphasized the service's meaning as a provider of new social relationships and meaningful activities. From the users' perspective, the service was clearly also a source of inconvenience and concern, mostly due to negative feelings associated with insufficient support and technical problems in using the VC technology. Therefore, we agree with previous studies (Antunes et al., 2018; Heart & Kalderon, 2013; Peek et al., 2014) that eHealth services designed for older people should be kept as simple as possible and adequate support and training should be available. Furthermore, to make the service fully functional, technical problems especially with the VC service should be investigated and fixed. Interestingly, the present study also revealed that using the service to alleviate loneliness could be *stigmatizing* for service users. Therefore, service marketing should focus on reaching the right target people and paying attention to not stigmatizing potential service users as lonely.

The identified barriers and enablers of older people's ICT use were quite similar to those previously reported. For example, we identified negative attitude toward technology, lack of digital skills, health status, and technical problems as barriers (see also Heart & Kalderon,

2013; Rasi, 2018) and social support networks, previous experience with technology, positive attitude toward new technologies, and technical support as key enablers (see also Livingstone, Van Couvering, & Thumim, 2005; Spann & Stewart, 2018). Interestingly, older people's self-efficacy—that is, skills and confidence in using new media technologies—proved to be key to both use and non-use of the service, thus functioning both as a barrier and an enabler (see also Livingstone et al., 2005; Spann & Stewart, 2018).

In the introduction, we criticized the European Commission's DigComp framework (Vuorikari et al., 2016) for being individual-centric and decontextualized. Our findings support the claim that digital competencies related to older people's health and well-being should be seen as distributed competencies of, in the case of the present study, older people's children as well as personnel of public and NGO health services and technology companies. Based on the current study, when digital competencies are distributed within older people's social network, domestication of technology (see also Silverstone & Haddon, 1996) can be supported.

Older people's digital competencies, such as the DigComp framework's competency 'being aware of digital technologies for social wellbeing and social inclusion' (Vuorikari et al., 2016, p. 9), are situated social practices (see Ivanic, 2004; Lipponen, 2010). Therefore, their competencies in using and willingness to use digital technologies cannot be understood without considering their historical, cultural, and social contexts. Our findings support this claim in that both use and non-use of the VC service were related to how good a fit the service was with users' existing social practices and technology-related cultural understandings (see also Hakkarainen, 2012). For example, even if the users had the digital competence to show their living room via the VC service, some of them were not comfortable with this and were unwilling to do it due to how they understood privacy. As a volunteer expressed, for some users and volunteers, being able to follow familiar cultural practices, such as sitting in a rocking chair, singing, and having coffee together via the VC service, supported the domestication of

technology (Lie & Sørensen, 1996; Silverstone & Haddon, 1996). Furthermore, older people's use of new media may be influenced by their previous media-related practices and experiences (Schäffer, 2007). This was evident in our findings. According to the volunteer, some service users, owing to their media use history, misunderstood that the VC service would increase their phone bill; therefore, they wanted to keep the VC calls short. Therefore, one of the lessons learned from this case study is that when designing eHealth services, users' existing social practices and technology-related cultural understandings need to be carefully considered as starting points. Findings of this study and areas for improvement will be presented and discussed with the NGO and home care services in the municipality in Finnish Lapland.

The present study had limitations. Had the three authors undertaken a collaborative data analysis, this would have increased the credibility of the data analysis. Also doing closer collaboration with the participants during the research, for example by using member checking procedure (Creswell & Miller, 2000) as a validation strategy could have improved the credibility of the findings. Further research is needed to strengthen the knowledge of how older people in various cultural settings use, do not use, and learn to use different eHealth services. Moreover, viewpoints from sparsely populated areas and opportunities that eHealth services could present there should be considered when studying these services.

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Table 1. Interview topics and sample interview questions.

| <i>Interview topics</i>                            | <i>Sample questions</i>   |
|--|---|
| <i>Service users</i>                               |   |
| Everyday life                                      | <ul style="list-style-type: none"> <li>- How are you?</li> <li>- Do you have any hobbies, and if so, what?</li> </ul>   |
| Social relationships and support                   | <ul style="list-style-type: none"> <li>- How often does home care visit you?</li> <li>- Does your family visit you and how often?</li> </ul>  |
| Use and availability of services                   | <ul style="list-style-type: none"> <li>- Where do you live and does services like the post office and bank available there?</li> </ul>  |
| Use of technology, especially the VC service       | <ul style="list-style-type: none"> <li>- Had you used any technical devices before the VC service, and if so, what?</li> <li>- How do you feel about the VC device?</li> <li>- Have you had any problems with the VC service?</li> <li>- Have you had enough support to help use it?</li> </ul>   |
| <i>Service coordinator and volunteers</i>          |   |
| Activities in the NGO                              | <ul style="list-style-type: none"> <li>- Tell us about your work as a volunteer/service coordinator in the NGO.</li> </ul>  |
| The phone and VC service                           | <ul style="list-style-type: none"> <li>- What is this phone and VC service and how does it work?</li> <li>- What kind of support do you receive as a volunteer for using the service?</li> <li>- How do you think the service fits in sparsely populated areas?</li> </ul>  |
| Older people as service users                      | <ul style="list-style-type: none"> <li>- Who do you think is an ideal user of the phone service?</li> <li>- Do you think the service could be improved, and if so, how?</li> </ul>  |
| Using or not using and learning to use the service | <ul style="list-style-type: none"> <li>- In your point of view, how easy it is to learn to use the VC device?</li> <li>- What kind of technical tools and skills does use of the VC service require from older people and volunteers?</li> <li>- What is the role of service user's social network when using and learning to use the service?</li> </ul> |



Table 2. Summary of the data analysis and findings concerning barriers to learning and using the phone and video conferencing service.

| <i>Examples of meaning units</i>   | <i>Examples of condensed meaning units</i>  | <i>Subcategories (n = number of codings from user/volunteer/coordinator interviews)</i>  | <i>Clustered category</i> |
|--|---|--|---------------------------|
| <p>“there were a few things I didn’t quite get, and I got exhausted and couldn’t cope with it, so I didn’t even touch it, and they took it away” (Service user)</p> <p>Then I, like, no way [will I visit you] no way, and it just went on and on. Then there were certain things, like, the service user obviously used alcohol, so that later on the person would be dipsy, sometimes real dipsy, and then these sex thingies started to come along. Well, that didn’t scare me either, at first I tried to shrug it off with humor, but I got sick of it eventually. I just didn’t feel like it anymore. (volunteer)</p> <p>”Well... Here on our end, just technical, sometimes there was no audio, sometimes we couldn’t see the image, and sometimes we were not able to connect when we made a</p> | <p>“I didn’t quite get”</p> <p>“I got exhausted”</p> <p>“couldn’t cope with it”</p> <p>” it just went on and on”</p> <p>” the person would be dipsy, sometimes real dipsy”</p> <p>”then these sex thingies started to come along”</p> <p>”sometimes there was no audio, sometimes we couldn’t see the image, and sometimes we were not able to connect”</p> | <p>Old age user: Negative perception of oneself as a technology user (38/0/0), Cognitive and physical difficulties (11/3/2), Lack of experience (2/11/0), Not being interested or inspired (6/0/0), Stigma (0/5/1), Attitude (0/5/0), Not seeing sense in use (5/0/0), Incompatibility with needs (4/0/0), Slowness in learning (4/0/0), Not knowing how to use the device (4/0/0), Lack of courage (0/2/1), Excessive shyness (2/0/0), Lack of telephone speaking skills (0/2/0), Belittling from others (2/0/0), Inability to learn (2/0/0), Fear (0/1/1)</p> <p>Social relationship: Inappropriate behavior (0/8/0), Inappropriate romantic feelings (0/5/3), Need for face-to-face contact (0/2/5), Participants do not ‘click’ (0/0/2), Lack of other users with whom to interact (1/0/0)</p> <p>Service: Technical problems (17/17/2), Peculiarities on the screen (foreign language, flickering light) (6/0/0), Insufficient support (5/0/0), Difficulties in marketing</p> | Barriers                  |

|  |   |   |  |
|--|---|---|--|
| <p>call. Of course, it might be, it might have been so that the older adult had connection via the USB modem, but they did not know how to restart the connection if the connection had for some reason been terminated. The technology should be so simple that if you press one button, everything will be turned on there, so that there is no need to [press] another one to connect the USB modem and... Well, there is some room for development.” (Service coordinator)</p> | <p>“it might have been so that the older adult had connection via the USB modem, but they did not know how to restart the connection if the connection had for some reason been terminated”</p> | <p>(0/4/1), Cost (2/1/1), Lack of technical device (0/2/0), Unfamiliarity of technology (2/0/0/), Unclearness of available programs (2/0/0), Privacy (0/2/0), Seeing program list with programs not available to user (1/0/0)</p> |  |
|--|---|---|--|

Table 3. Summary of the data analysis and findings concerning enablers to learning and using the phone and video conferencing service.

| <i>Examples of meaning units</i>  | <i>Examples of condensed meaning units</i>   | <i>Subcategories<br/>(n = number of codings from user/volunteer/coordinator interviews)</i>   | <i>Clustered category</i> |
|---|--|---|---------------------------|
| <p>“I don’t lose my temper, so I didn’t start out by getting all nervous about it” (Service user)</p> <p>”Yes, I did, I did. Or already before the first call, well, they showed and presented the device to me. Then when I came to use it for the first time, I think there was the, [name of service coordinator omitted], with me. She left, but it is quite simple, as easy as making a [regular] phone call.” (Volunteer)</p> | <p>“I don’t lose my temper”</p> <p>“I didn’t start out by getting all nervous about it”</p> <p>“they showed and presented the device to me”</p> <p>“I think there was the, [name of service coordinator omitted], with me”</p> | <p>Old age user: Positive perception of self as technology user and learner (22/0/0), Willingness and ability to practice and learn (12/0/0), Previous experience (0/6/3), Attitude (0/7/2), Cognitive and physical health and abilities (1/5/1), Interest (4/0/0), Positive experiences of using technology (4/0/0), Courage (3/0/0), Enthusiasm (2/0/0), Positive relationship (0/2/0), Calmness or patience (1/0/0), Competence (2/0/0), Ability to take care of oneself and one’s business (1/0/0)</p> <p>Service: Support and technical support (16/9/5), Technical device (0/4/2), Usability (1/0/0), Free service (0/0/1), Marketing (0/2/0)</p> | Enablers                  |

Table 4. Summary of the data analysis and findings concerning the meanings assigned to the phone and video conferencing service.

| <i>Examples of meaning units</i>  | <i>Examples of condensed meaning units</i>   | <i>Subcategories<br/>(n = number of codings from user/volunteer/coordinator interviews)</i>  | <i>Clustered category</i>                          |
|---|--|--|--|
| “The kind of good folks who I can understand and who understand me. So that the interaction, it’s mighty important.” (Service user)   | “interaction, it’s mighty important”   | <p>Social interaction: networks and loneliness (5/19/17), social presence (0/5/3), deep conversations (0/1/0), confidential relationship (1/0/0)</p> <p>Meaningful activities: activities and structure (7/1/5), maintaining cognitive functions (0/3/0), reminiscence (0/3/0)</p> <p>Positive emotions: positive and neutral feelings (0/8/3), rewarding (0/5/1), provider of joy (0/2/1)</p> <p>Safety (0/0/2)</p> | Support for social interaction and well-being      |
| ”Yes, and that is exactly what I would like, because what I see, to look at this thing, what could come out of it and how it could help these people, and especially, if you think about the villages of [name of municipality omitted], those who live fifty or sixty miles away, those whose neighbors have all left, those who want to connect.” (Volunteer) | <p>”fifty or sixty miles away”</p> <p>”those whose neighbors have all left, those who want to connect”</p> | <p>Needed (0/16/0)</p> <p>Sparsely populated area (0/9/6)</p> <p>Much needed service (0/0/8)</p> <p>Efficiency (0/2/1)</p> <p>Staying abreast of technology developments (0/1/0)</p> <p>Usability (1/0/0)</p>  | New and needed service for sparsely populated area |
| “Well, it started, getting to my nerves”. (Service user)  | “getting to my nerves”   | <p>Negative feelings (28/7/2)</p> <p>Technical problems with the service (10/0/0)</p> <p>Insufficient support in use of technology (7/0/0)</p> <p>Secondary in meaning (0/2/1)</p>   | Source of inconvenience and concern                |